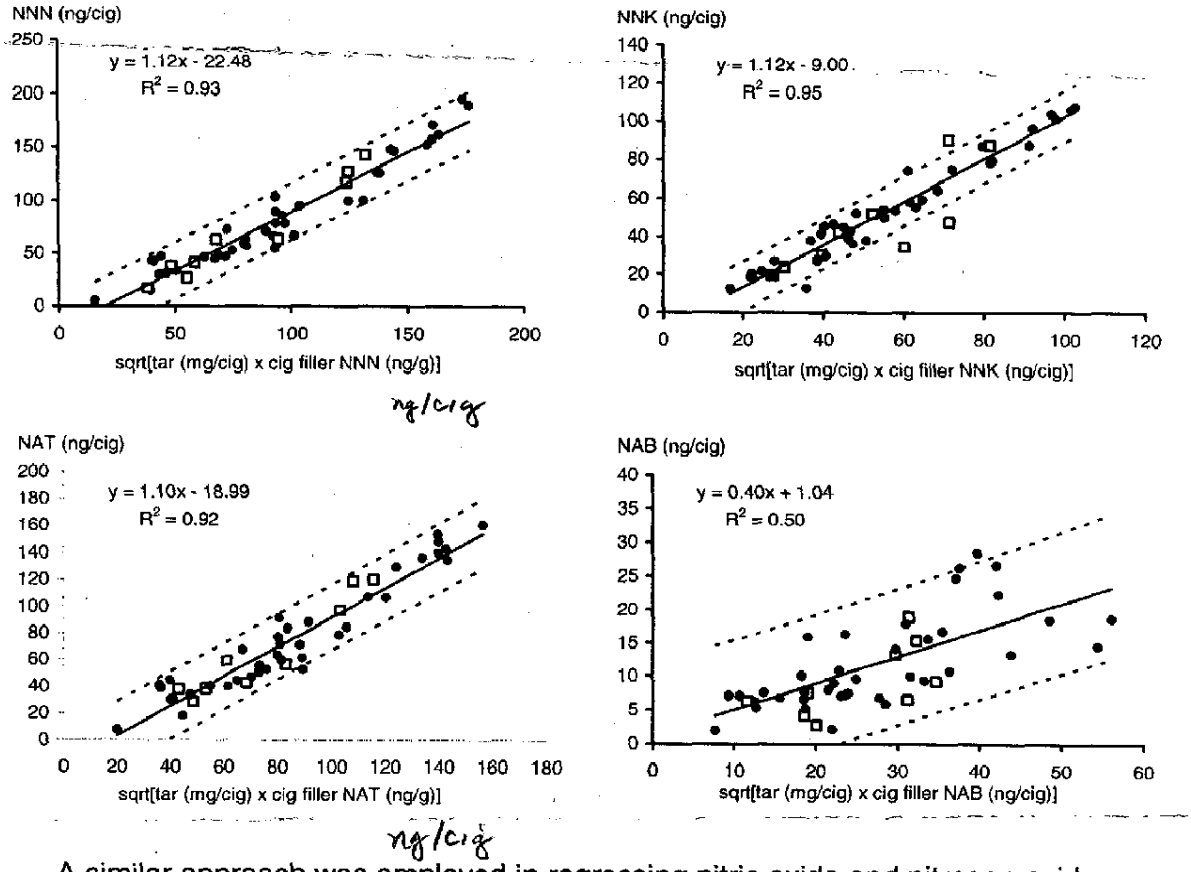
Figure 2 contains transformed variable regression models and prediction intervals for mainstream smoke NNN, NNK, NAT, and NAB yields.

Figure 2: Prediction models for ISO mainstream tobacco specific nitrosamine yields
(—) Best fit regression equation, (- - -) 95% Prediction interval, ● Exploratory brands, □ Validation brands



A similar approach was employed in regressing nitric oxide and nitrogen oxides yields using [sqrt (tar × cigarette blend-nitrate)] as the independent variable. Prediction models for nitric oxide and nitrogen oxides are found in Figure 3.

Figure 3

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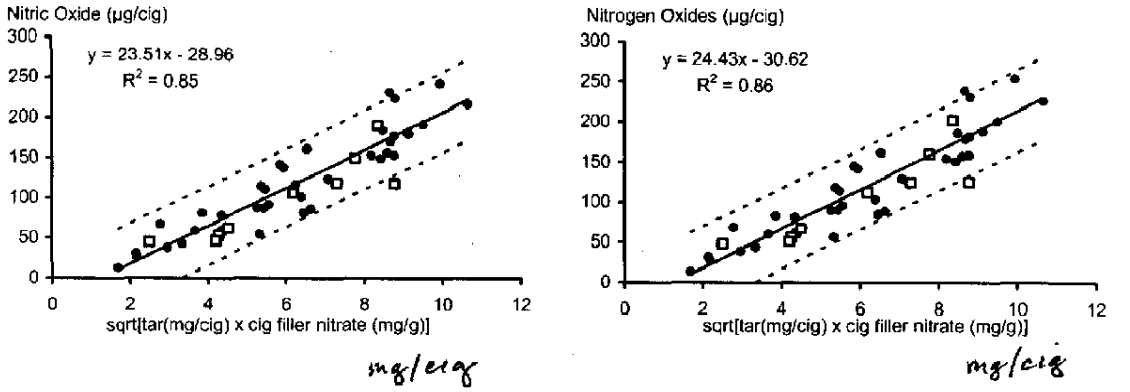
Source: https://www.industrydocuments.ucsf.edu/docs/phlx0001

Figure 3: Prediction models for ISO mainstream nitrogen oxides yields
(—) Best fit regression equation, (- - -) 95% Prediction interval, ● Exploratory brands, □ Validation brands



With these transformed interactive variables, mainstream smoke TSNA and nitric oxide(s) predicted smoke yields were improved relative to those of simple linear regressions where tar was the only independent variable. The use of prediction models beyond simple linear regression for TSNA or nitrogen oxides yields would have less impact if all brands were similar in tobacco blend-nitrate or blend-TSNA concentration. Since this study included brands from a wide range of regional markets, and consequently a wide range of concentrations of these tobacco components, different regression models were warranted.

(4) Prediction Error

To test the reliability of the regression equations, the measured constituent yields for the nine validation brands were compared with the predicted yields and the 95% prediction intervals. Table 3 includes the predicted smoke yields and calculated prediction errors (PE). A positive or negative PE indicates the predicted yield was greater or less, respectively, than the average measured yield. Greater than 90% of constituent yields for the validation brands were within the 95% prediction intervals and prediction errors were similar in magnitude to measurement standard deviations. Measured brand-average constituent yields outside the prediction intervals are

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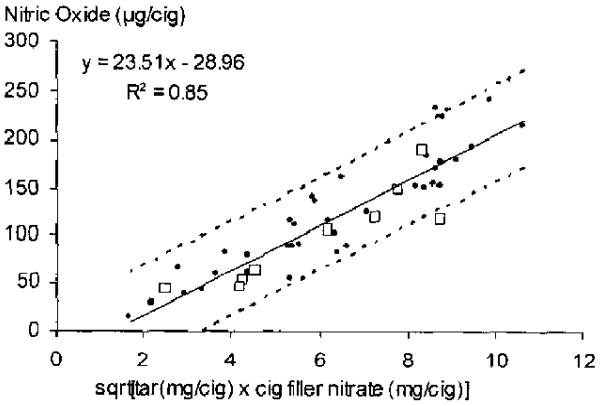
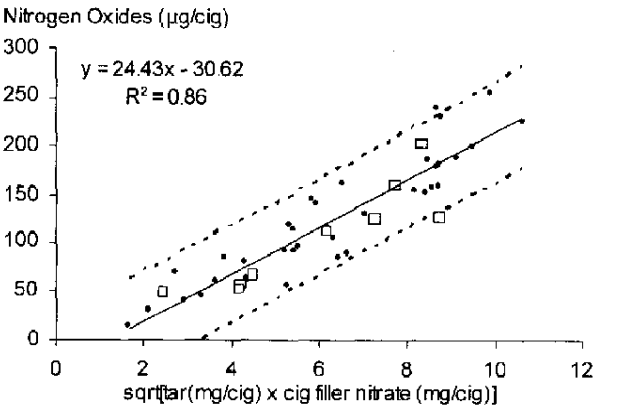
Source: https://www.industrydocuments.ucsf.edu/docs/phlx0001





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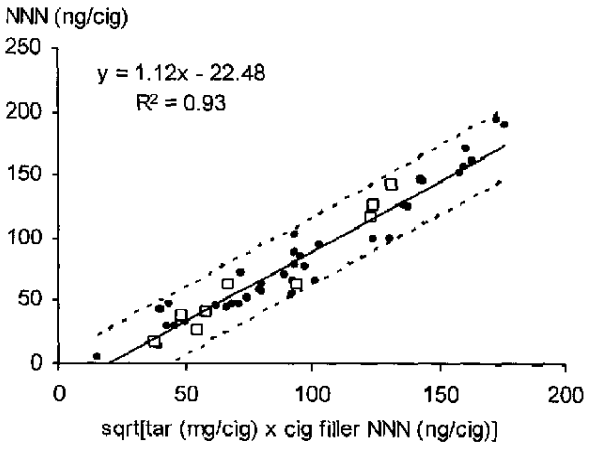

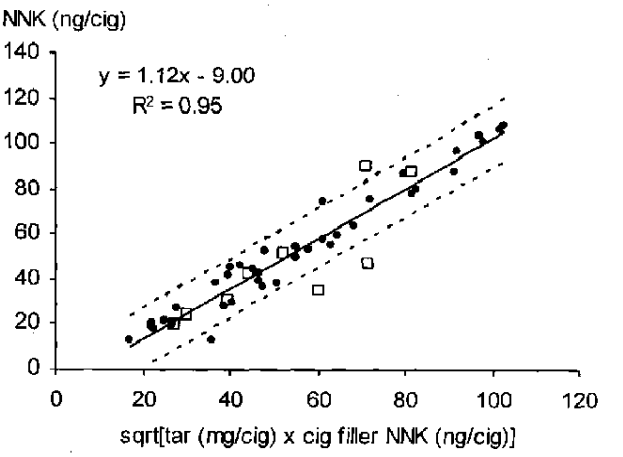

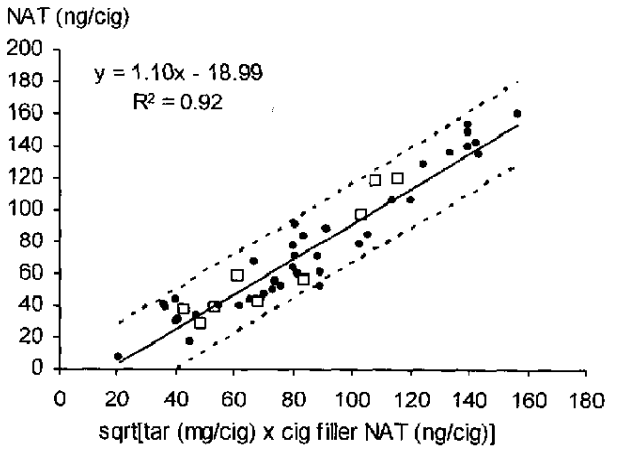

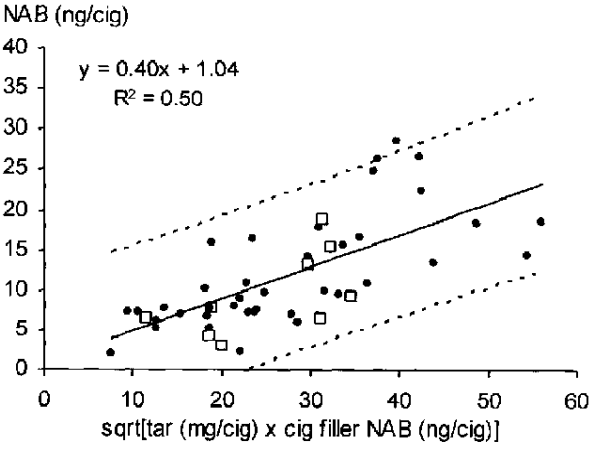

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